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**Why do young adults with Type 1 diabetes find it difficult to manage diabetes in the workplace? Time pressures and lack of routine are key reasons.**

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**Abstract**

This article explores how and why workplace environments impact diabetes management for adults people with Type 1 diabetes, 23-30 years of age. Interviews

were conducted with 35 young adults, 29 women and 6 men. The majority of these interviewees worked in sectors such as banking, technology and administration. Young adults found it difficult to manage diabetes in the workplace for two main reasons: work-related time pressures and the non-routine nature of interviewees' work and working environment. Young adults also found it difficult to get the time to exercise both inside and outside of work. Young adults with Type 1 diabetes need to be provided with the tools and technologies that they need to manage diabetes in modern flexible workplaces.

**Keywords:** Young adult, emerging adult, work, diabetes, exercise.

## 1. Background

Type 1 diabetes is a demanding condition to manage during young adulthood, even for adolescents who previously experienced excellent control of their diabetes (Garvey and Wolpert, 2011). Young people in this developmental period tend to have lifestyles that are more inconstant than their teenage or older adult counterparts (Lancaster et al., 2010). Many of them are transitioning from environments where they often had a great deal of stability in their lives, to new contexts that are characterised by less formal structure and support (Balfe, 2009). Young adults can feel invincible and engage in what are, from a diabetes management perspective, risky practices (Balfe 2007, Garvey and Wolpert, 2011; Weissberg-Benchell et al., 2007). Unsurprisingly, diabetes control often suffers during this time of life (Bryden et al., 2001) and young adults often experience relatively high levels of morbidity and mortality (Peters et al., 2011).

While the transitional period between the teens and the early twenties is undoubtedly a risky phase of life for young adults with diabetes, researchers have recently begun to argue that risk is not the full story of young adulthood for these young people (Garvey and Wolpert, 2011). Researchers highlight a second phase of young adult development, extending approximately from the early-twenties to about thirty years of age, which is characterized by stability rather than risk. Researchers refer to this period as 'later young adulthood' (Peters et al., 2011). Young adults in this age range have usually finished education and entered the workforce. They often face family responsibilities (Weissberg-Benchell et al., 2007). They tend to be more open to improving their self-care than their younger counterparts (Garvey and Wolpert, 2011)

as well as more concerned about long-term diabetes complications (Peters et al., 2011, Van Walleggem et al., 2011). However while this second phase of young adulthood is typified by a general stabilization trajectory, researchers also theorize that a number of factors may undermine the general improvements in diabetes management outlined here (Garvey and Wolpert, 2011). Difficulties managing diabetes in particular environmental contexts, such as the workplace, have been identified as one such factor (Markowitz and Laffel, 2012).

Research, including health geography research, that has been conducted on young adults with diabetes has tended to focus on young adults making the transition to young adulthood (Anderson and Wolpert 2004; Garvey and Wolpert 2011); and notably much of this research has focused on university students with diabetes, specifically on how young people make the transition from home and school to university (Balfe, 2007; Balfe and Jackson, 2007; Balfe 2009; Miller-Hagan & Janas 2002; Ramchandani *et al.* 2000). There has been little empirical work conducted on young adults in the second phase of young adulthood. This article explores how and why workplace environments effect diabetes management for young people with Type 1 diabetes, 23-30 years of age. Although Markowitz and Laffel (2012) have identified that young adults can experience difficulties managing their diabetes in work, there is a lack of understanding about why these difficulties occur. Appreciating and addressing workplace-related diabetes management difficulties is important not only in order to reduce short-term morbidity but also to lay the groundwork for longer-term patterns of good diabetes control (Anderson and Wolpert, 2004). Later young adulthood is a formative stage of development for young people with diabetes, and young people who develop optimal diabetes control during this period are likely to maintain such control into the future (Anderson and Wolpert, 2004).

## **2. Methods**

### *2.1 Sample*

Study participants (n=32) were primarily recruited from an Irish Facebook support group for young adults with Type 1 diabetes, and from the Facebook page of Diabetes Ireland, Ireland's leading diabetes charity. The recruitment message indicated that all young adult who took part in the study would receive a 30 euro gift token for their time. We concentrated our recruitment efforts on Facebook because we felt that the

social media site would provide an efficient and cost-effective platform for reaching a young adult audience. Recruitment messages indicated that the project was looking to talk to young adults with Type 1 diabetes who were between 23 and 30 years of age. Recruitment stopped after interview thirty-two as we felt that we had reached data saturation, that is the point where no new themes were emerging from the interviews. To ensure that this was in fact the case we completed an additional three interviews with young adults who we recruited from a specialist young adult clinic in a Dublin hospital. The themes that arose in those three interviews were similar to those that arose in the Facebook interviews and therefore we did not seek to recruit more participants, i.e. we were confident that we had reached data saturation.

Twenty-nine women and six men with Type 1 diabetes were interviewed in all. See Table 1 for young adults' self-reported demographic characteristics. The overall sample size (35 young adults) is within best practice guidelines for studies based on semi-structured qualitative interviews (Morse, 2000).

## *2.2.Approach*

Interviews were chosen as the research method because we wanted to explore participants' accounts and experiences in detail. All interviews were conducted by the first author. Seventeen of the interviews were conducted over the telephone and eighteen in person. Interviews with young adults lasted 34-86 minutes, with telephone interviews being shorter.

Before each interview began, interviewees were given information about the project and what taking part in it would practically involve (the approximate length of the interview and the Types of questions that the interview would cover). Participants were informed that the interviews would be taperecorded, and that the interviews would be typed up and reported in an anonymous format. Respondents who completed face-to-face interviews were asked to give written consent to take part in the study. Respondents who completed telephone interviews were asked to give verbal consent.

The young adult interview schedule was divided into two sections. The first section asked young adults to talk about day-to-day factors in their lives that they felt



impacted their diabetes control. The second section of the young adult interview schedule asked young adults to talk about their perspectives on, and experiences of using, diabetes health services in Ireland. It is the findings generated by questions in the first section of the interview schedule (factors that influence day-to-day diabetes management) that are reported in this article.

### *2.3. Analysis*

Interviews were thematically analyzed [21] in a word-processing package (MS Word). The first and the second authors double-coded the first four interviews and the other authors provided feedback on their analysis. The first author then analyzed the remainder of the interviews. Analysis for each interview began by ‘open coding’ the interview transcript, giving each section of the transcript that addressed a particular issue a descriptive tag or ‘code’. These codes were then compared and contrasted within and across interview transcripts in order to determine if some of them could be subsumed under high level concepts or ‘categories’ (e.g. all posts labeled with the descriptive tags ‘neglect of discretionary diabetes management activities in the workplace’ and ‘difficulties leaving work to go to clinical appointments’ were placed under the higher level category ‘impact of workplace times pressures on diabetes management’). The principle categories or themes that were identified from the interviews were: time pressures in the workplace; non-routine nature of working-environment; healthy food consumption disrupted by in the workplace; local food environment; impact of work on exercise; impact of travel on diabetes management; and impact of unemployment on diabetes management. All of these themes were generated inductively from the data: prior to the interviews commencing we did not anticipate that work would emerge so strongly in participants’ accounts as a factor impacting diabetes management, or that these work-related themes in particular would emerge as being important. **Illustrative extracts from the interviews are located in the results section. Additional analysis supporting interview extracts are located in Tables 2 and 3.**

We checked the final draft of the article with the young adults who took part in the study. Young adults felt that the paper accurately described their experiences.

### *Ethical approval*

Ethical approval was obtained from our local University ethics committee.

## **3. Results**

Interviewees in this study (n=26) were mostly employed as a). ‘knowledge workers’ in software engineering firms, pharmaceutical or biotechnology companies or the banking and financial sector b). as administrators or secretaries or c). they had returned to higher education in their mid- to late- twenties to upskill themselves or because they had been made redundant; a number of interviewees returned to college specifically to study medicine. **This latter group of interviewees, as well as discussing the difficulties of managing diabetes in university, also discussed their previous experiences of managing diabetes in the workplace. As such we have included these young adults’ work-related (but not college-related) experiences in this article. Five interviewees were unemployed at the time that the study was conducted and an additional three were employed in the food services sector (e.g. working in restaurants, coffee shops).**

### *3.1. Time pressures in the work place*

The workplace was described by most interviewees as a space characterized by long-working hours and a high intensity of activity. Most interviewees said that they were often under significant and continual times pressures to process a large number of tasks.

I’m in my current job actually about two and a half years. Things are really hectic. (Female, 30).

Interviewees often felt that they had little time to engage in diabetes management activities at work, and some regularly struggled to insert their diabetes management activities into their work days. At times when their work became especially busy a number of interviewees noted that they were likely to neglect what they considered to be ‘discretionary’ aspects of their diabetes management. Interviewees most often referred to the recording of blood sugar test results here, but a number of them indicated that they sometimes neglected to test their blood sugars or delayed their

insulin injections. Interviewees who felt dissatisfied or angry about their diabetes appeared to be especially likely to ignore their diabetes when their work ‘sped up’.

Because I work I’m constantly on the go. I could have a walking, eating lunch so finding somewhere to stop, do the blood sugar, I just don’t have time for that [testing]. (Female, 30).

Some interviewees appeared to experience strong internal and external pressures not to let their diabetes ‘steal’ time away from their work-related activities. This was especially the case for interviewees who worked in highly competitive sectors such as banking. A number of these interviewees seemed to feel that their diabetes management activities contravened the perceived behavioural norms that governed their work places, which directed that all employees’ time and effort be placed into productive work related tasks. Time for diabetes management seemed to be interpreted by these interviewees as something that forced its way into, and disrupted, work time. Several interviewees described feeling guilty or self-conscious when they had to take time out from work to monitor or regulate their diabetes, and many of them tried to squeeze down the amount of time that they spent on diabetes management in the workplace as much as they possibly could.

It’s kind of hard, like people go out to the shop and grab their lunch and sit in front of the computer and keep working and eating. You have to add in extra time to run into the bathroom and take your insulin and blood sugars and you’re kind of, they expect you to be constantly at your desk so you have to be as quick as possible, test your sugars, go get your food, come back, take insulin, come back eat the food. (Female, 24).

Workplace time pressures also impacted some interviewees’ willingness and ability to attend diabetes-related clinical appointments. A minority of young adults said that they sometimes skipped appointments because they were unable to take the time out of their schedules to attend hospital clinics. This was especially the case where diabetes health services were perceived to be disjointed and where young adults would have to return to health services multiple times for clinical information. Interviewees who did attend their appointments sometimes appeared to feel stressed

or self-conscious about being away from the workplace during work hours. They felt that this risked creating the impression that they were working less intensely than their colleagues. Although many of the findings of this study were generalizable beyond the Irish context, interviewees' anxieties here were likely accentuated by the fact that when the study was conducted Ireland was in the middle of a major economic collapse, where the official unemployment rate was above 15%. To regulate these fears, some interviewees used a portion of their annual leave to 'buy' time away from the workplace so that they could attend hospital appointments without feeling anxious, but this frustrated them as they felt that their free time was limited and much of it was already taken up by diabetes care.

They say 'you can't get your eyes done today, they have their own special clinic on a Friday'. You're like, I don't have a life. They say I can take x amount of hours out of my day whenever to come and sit in the hospital. Wrong. I can't. I'm lucky enough to have a job and I want to keep it. (Female 30).

The effects of work-related time pressures on day-to-day diabetes management often became especially acute when interviewees had to take on additional time-consuming tasks outside of their main workplace. A number of female interviewees noted that preparing for weddings often eroded a considerable amount of whatever 'free' time that they had, which would often have been time that they used to monitor and regulate their diabetes. Interviewees who needed to take up additional employment, for example to pay the mortgages on their homes, noted similar difficulties. Multiple jobs were considered to be difficult because travelling between different workplaces often absorbed time that interviewees could use to regulate their diabetes, above and beyond the time demands of the jobs themselves.

I'm 30, almost 31. I'm working full time, two jobs at the moment. Mon-Fri in an office in town and weekends I work in a café. My levels are high because I have so many things going on. I'm absolutely exhausted. (Female, 30)

Time pressure in the workplace also induced a significant amount of work-related stress in many interviewees. A number of young adults noted that when they became

stressed in work they tended to snack more often or eat more sugary foods, which usually raised their blood sugar levels. Some also believed that work-related stress by itself tended to make them hyperglycaemic.

Work has been quite stressful and as I said, when I'm stressed I eat more. That has raised the sugars up a bit. (Female, 29).

### *3.2.Non-routine nature of the work environment*

Many interviewees described their work environments as being non-routine in nature. Rather than engage in the same tasks in the same place at the same time every day, workplaces and work activities were often 'bitty'. Many young adults reported that they had to deal with a stream of constantly changing tasks and deadlines. As a result the times that they started and finished work often changed, and their day to day timetable was often irregular. This made it difficult for them to effectively routinize their diabetes management practices, thereby increasing the likelihood that they would either skip, forget or delay these practices, or engage in them in a non-systematic fashion. Interviewees who did shift-work, or who were engaged in part-time or casual work, found developing diabetes management routines to be especially difficult. The entire temporal and physical structure of these interviewees' work-days could change from one week to the next, not just the tasks that these interviewees engaged in on particular days.

Although their jobs certainly did not appear to be easy, interviewees involved in 9-5 administration jobs appeared to find it easier to develop diabetes management routines at work, mainly because their overall daily structure did not alter significantly from day-to-day. However these interviewees could experience localised time 'hot spots' at work they were placed under considerable pressure and where their diabetes regulation consequently tended to slip.

### *3.3.Disrupting food consumption*

Work-related time pressures and lack of routine often complicated interviewees' efforts to eat healthily. Some interviewees noted that they regularly delayed lunch when they were busy in work, for example when they needed to attend a meeting. Instead of eating a healthy lunch, these interviewees noted that they sometimes tended to snack on whatever type of food was easily available to them in or near their workplace, sometimes food that they considered to be suboptimal for their diabetes management.

I'm always busy. I would never get time for dinner. I might get a lunch break but I can't find half an hour to heat up a meal. I used to end up running into the chipper (Female, 28).

Needing to stay late in work in the evenings could disrupt the timing of evening meals and associated insulin injections. For example a number interviewees indicated that they often worked late which meant that they did not eat dinner and inject their insulin until after 9pm, increasing, they felt, their risk of experiencing night-time hypo- or hyperglycaemia.

Furthermore if meals had to be eaten late at night, this usually meant that interviewees had to snack earlier on in the evening in order to maintain their blood sugar levels. This could send interviewees' blood sugars high and make it difficult to determine out how much insulin to take through the course of an evening. Several female interviewees noted that they tended to overcompensate the amount of insulin they injected after snacking, regularly injecting too much. Although this increased their risk of developing hypoglycaemia, many interviewees had very strong fears about becoming hyperglycaemic and developing long-term diabetes related complications.

#### *3.4. Local food environment*

Several interviewees' struggles to eat healthily at work were further complicated by the fact that their places of work were located in what were effectively 'food deserts', that is areas where they found it difficult to obtain good quality food irrespective of whether they had the time to obtain such food or not. Examples of these kinds of environments included business parks. These interviewees said that it was difficult for them to obtain good quality food in business parks and that the food that was

available was often relatively cheap and carbohydrate-heavy and was suboptimal for people with diabetes. One interviewee noted that her place of work was effectively her car and that it was difficult for her to eat healthily when driving around. Conversely, interviewees who worked in high tech companies noted that they were often supplied onsite with an overabundance of foods, including sugary and processed foods- they worked in what were effectively food oases. A problem for these interviewees was controlling their appetites, especially when they were working in the evenings or when they were bored in work.

### *3.5.Impact of work on exercise*

Many interviewees indicated they had to spend a substantial portion of their time every day commuting to and from their home and their places of work, which they felt significantly reduced the opportunities that they had to exercise. Interviewees who relied on public transport often found it difficult to go to the gym in the evenings, as the times of their buses and trains often became irregular after working hours. Irrespective of whether they went to the gym or not, many interviewees- particularly those living on the rural outskirts of cities- felt that by the time that they returned home it was often too late for them to exercise. Other interviewees indicated that they regularly felt exhausted when they came home after a long day in work and would often 'collapse' in their living rooms in front of the television - this is where partners often proved to be useful as partners would monitor interviewees' practices and force them to go for a walk or a run even if they were exhausted.

I'm up at 6.30am and by the time I get home it's 7pm. If I join a gym, after work my buses aren't that regular and I'd end up getting home ridiculously late. (Female, 30).

All interviewees felt that lack of exercise was problematic, however. They believed that regular exercise was essential to achieving good control over diabetes. The data-driven work that many interviewees were involved in, while intense, afforded them few possibilities to be active during the day. Interviewees often indicated that they commuted to and from work by car, spent substantial portions of the day sitting in front of computer screens and then often had lunch in the same room or building in which they worked. All interviewees recognized that this kind of high-stress,

sedentary lifestyle was bad for people with diabetes and as a result some put substantial efforts into trying to build exercise into their daily routines, for example going for walks with colleagues or friends at lunch time, or making sure that they regularly got up and walked around their offices as much as possible (though as noted some young adults felt pressure not only to be in work but to be constantly sitting at their desk in work). Interviewees who worked second jobs, however, felt that it was often impossible to get the time to exercise.

I recently changed roles in my company so I'm not sitting at my desk the whole time. I do a lot of walking around the site. In the first five years working there, I was doing pure project management. I was literally going in and sitting at my desk. (Female, 29).

Seasonality could also impact young adults' exercise activities. Interviewees noted that they were more likely to go for walks at lunch time and go to the gym when the weather was good. It was notable that interviewees' motivation to exercise, not just their opportunities to, decreased substantially during winter months and they often felt that their HbA1c scores increased during these months. However good weather was difficult to find in Ireland.

I'm pretty good actually, I joined this gym in the summer and I was going in the mornings before work and that was great because it really helped my sugars and I had the effect through the whole day. Then the winter came in and dark mornings, I stopped going and definitely a big effect [on blood sugar levels]. (Female, 30).

### *3.6. Impact of work-related travel on diabetes management*

Some interviewees said that they emigrated for work-related reasons, mainly to Dubai and similar countries in the Middle East. Two study participants also took long-term career breaks to travel. In general, all of these interviewees felt that the initial shift away from their day-to-day routines to a new environment negatively impacted their diabetes control. Their new daily structure was often quite different, their activity levels often changed dramatically and it could take a lot of effort to understand new foods and determine how much insulin to take for them. However all interviewees



noted that once this initial transition period passed their control often, though not always, improved. Being in a new country made interviewees more conscious about what they were eating, more cautious, as they lacked a social support safety net of friends and family to help them if anything went wrong. Consequently they tended to pay more attention both to what they were eating and to monitoring their diabetes. Interviewees who travelled noted that their activity levels often significantly increased compared to what they had been in their jobs in Ireland, which had benefits for their control and for their general health. However interviewees also noted a lack of country-specific information about how to manage diabetes when working or travelling abroad, and that they were often left to 'figure things out' for themselves.

At first it just getting used to the foods and the insulin doses and the climate. I realised the food, the breads and things, have a lot more sugar in them and it took me a while to find the right food in different shops that wouldn't be so sweet. So my blood sugars actually rose a lot when I first got here. Their food is a lot different. I've a stricter diet here. (Female, 27).

### *3.7. Impact of unemployment*

Five interviewees were unemployed at the time that the study was conducted. These individuals found diabetes management to be difficult for reasons that were partly similar to the other interviewees- they lacked structure in their lives; and partly the opposite- they had too much, rather than too little, free time. Three of these individuals also appeared to be distressed by their diabetes, and their management of it seemed to be emotionally driven. When they felt angry or distressed at their diabetes they often did not test or record their blood sugar results. Because they had a lot of free-time, they said that they spent most of their time at home where they had few distractions to prevent them from ruminating about their diabetes and its perceived negative impact on their lives. They also lacked fixed points in their daily schedules which would have directed them to take food, insulin injections or exercise at particular times and places during the day. As such their diabetes management routine often tended to drift from day-to-day and they noted that they regularly became hyperglycaemic. These three interviewees also said that staying at home all day and not working made them feel bored and stressed, and that they tended to snack more on junk foods when they felt 'down'.

Interviewee: I lost my job and my diabetes was kind of all over the place after that. It's all courses I've been doing. It's about 5 or 6 courses I'm after doing. The routine of doing the day time courses was great because I was getting up, was out and my sugars did work out better thinking about it now. Because I wasn't sitting there doing nothing.

Interviewer: Does it tend to get worse when you are sitting there doing nothing?

Interviewee: Yes. That's when I start picking at stuff and I don't do a needle when I should be doing it. I'm like I'll do it in a few minutes and then I forget about it. By the time I think of it my sugars are high. (Female, 27).

### *3.8. Solutions to problems managing diabetes in the workplace*

Interviewees identified possible solutions to the problem of managing diabetes in the workplace. Ideally, most felt that it would be best to have a structured routine at work, with similar start times, lunch times and finishing times everyday. This kind of routine would make diabetes predictable and therefore easier to manage and to control.

Having a routine always helps. Changes always bring some kind of fluctuation in blood sugar levels. (Male, 29).

Many felt that developing routines would be difficult to achieve given the types of work environments in which they were embedded, however. Some therefore argued for the importance of being able to obtain diabetes technologies such as insulin pumps, and being able to attend carbohydrate counting courses, that would enable them to cope easily and flexibly with the changing nature of their daily routines. Others argued that it was important to take a balanced approach towards work and personal life, and leave the workplace at a reasonable time every evening; though some also expressed an anxiety that this could have a negative impact on how others in the workplace would perceive them. One interviewee felt, however, that it was impossible to balance the demands of her job with those of her diabetes, and she quit her job. Understandably, this was extremely distressing to her and had a significant negative financial impact. However this interviewee had also been trying to become

pregnant, which she was unable to do given the kind of diabetes control that she was able to achieve in work.

I was working full time until a few weeks ago. I decided to give up work but I had to, I had no choice. I went in at 9am and didn't get out till 8pm. Long hours, meetings, travelling, I just couldn't do it. The diabetes was going down hill. (Female, 30).

#### **4. Discussion**

This study found that young adults experienced difficulties managing diabetes at work, mainly as a result of time pressures and lack of routine. These findings help to explain why young adults experience difficulties managing diabetes in the workplace (Markowitz and Laffel, 2012) and answer demands from health geographers that researchers open the 'black box' of place, including the workplace, in health research (Feng et al., 2010). The findings also lend support to health geographers' assertions that 'place' and 'environment' are critical concepts in health related research (Andrews et al., 2012; Panellia and Gallagher, 2003), and diabetes research in particular (Balfe, 2007). The study's findings differ from some previous health geographical research, however, in that they demonstrate that for some individuals with chronic conditions, their main concern is not being prevented from accessing the workplace, whether as a result of workplace company policies or as a result of the workplace being an inaccessible and disabling environment; rather their main concern is actually figuring out how to manage their condition once they are in the workplace.

The workplace-related time pressures that were detected by this study are not unique to young adults with diabetes. In capitalist economies in the 21<sup>st</sup> century workers are under ever-increasing pressures to 'do more with less time' (Widerberg, 2006). For all types of workers, from knowledge economy workers of the type who took part in this study, to waiters and cleaners, both the amount of work that individuals have to do has increased, as has the pace at which they have to do it (Widerberg, 2006). This increasing tempo of activity has meant that workers often experience their time, both inside and outside of the workplace, as 'squeezed', 'crunched' or 'compressed' and they often feel harried and under considerable stress (Bryson et al., 2007). Workers often view time as a limiting factor in their life; the time demands that the workplace

puts on them often exceeds the time that they have, forcing them to triage their various commitments (Carrigan and Duberley, 2013; Szollos, 2009). This could be seen in the young adults in this study who often had to trade-off their need to spend time on their workplace activities against their need to attend to their diabetes, or their need to leave work to attend clinical appointments. It was notable that when young adults needed to attend to their diabetes at work they often appeared to feel a degree of anxiety about doing so, even when they had received their employers' approval. Subjectively, they seemed to feel that they were contravening the types of productive, time-driven identities (Mackian, 2000) and performance norms (Dyck and Jongbloed, 2000) that they felt that their workplace was implicitly or explicitly encouraging them to embody. The findings here support previous research which indicates that young adults with diabetes are just as likely to be as successful and employed as individuals without diabetes (Lloyd et al., 1992), though they may be more concerned than their counterparts without diabetes about the risk of losing their jobs (Griffiths et al., 1993).

The difficulties that interviewees experienced routinizing their diabetes management activities were partly time-related, but stemmed as well from the nature of the type of work that they were engaged in. Researchers have highlighted that 'knowledge work' is often characterised by the constant arrival of fragmented tasks onto workers' desks, each with their own intense deadlines and demands, making it difficult for employees to develop predictable structures (O'Carroll, 2008).

Workplace time pressures and lack of routine combined to make it difficult for many interviewees to find the time to exercise or to eat healthily. This negative impact continued even after young adults had left work in the evening, demonstrating the interconnectivity of place and space in the diabetes management practices of young adults (Crooks and Chouinard, 2006). It was notable that several interviewees felt that their workplaces did not facilitate exercise or walking (Andrews et al., 2012), and also that seasonality appeared to have a marked impact on their exercise intentions and behaviours (Montemmuo et al., 2011). These factors in combination are concerning as they indicate that some young adults are getting very little exercise both inside, on the way to, and outside of the workplace, thereby increasing their general health risk and undermining their ability to control their diabetes. It was notable that interviewees who were reliant on public transport and who lived some distance from their place of

work often found it especially difficult to find the time to exercise, largely because their timetables were dependant on the bus and train companies (Coventy and O' Dwyer, 2009).

The findings of this study have implications for diabetes researchers. Firstly, they draw attention to the fact that young adults in their mid to late twenties can struggle with diabetes management routines and timetables just as much as their younger counterparts. The difference is that younger adults, in their late teens, are often obviously 'out of control' and/or are managing their diabetes in environments that are almost natively inimical to diabetes management (such as the first year of university) (Pyatak, 2011). Young adults in the second phase of young adulthood experience many of the same difficulties, but do so in environments that seem on the face of it to be quite positive for diabetes control. The modern workplace for knowledge workers, however, is something of a black box; beneath its ostensibly stable surface can be a very unstable reality. The study also highlights the need for researchers to pay attention to the experiences of more successful young adults with diabetes. Diabetes researchers often focus most of their attention on young adults deemed to be at significant risk, such as those with alcohol problems or those suffering from eating disorders. Less risky young adults, with good HbA1C scores, are often relatively neglected. The data presented by this article highlights that these successful young adults may in fact be struggling with their diabetes management, though perhaps in less obvious ways.

The recommendations that young adults made to improve diabetes management in work are all sensible. It is unlikely that the workplace time pressures will ever cease. It is therefore important that young adults be provided with the tools and the technologies, such as CSII ('insulin pumps') and opportunities to go on carbohydrate counting courses (Lancaster et al., 2010), that they can use to maintain diabetes control in the modern, flexible workplace. It would be helpful if diabetes clinics drew up country specific advice for young adults who are considering travelling for work-related reasons, given the impacts that changes in environments can have on diabetes management (Pyatak, 2011). It would be useful if clinics provided these young adults with telesupport and advice while they were abroad. Young people should also be advised of the need to exercise during the day time, even if it is only going for a walk

for twenty minutes.

**This study has several limitations. Respondents self-selected themselves to take part in it, and the majority were recruited from internet support sites for people with diabetes. Study participants may therefore represent a particular cohort of young adults with diabetes who found balancing diabetes and work to be particularly upsetting or difficult. Conversely, study participants had reasonably good diabetes control (as measured by their self-reported HbA1c scores and the number of times that they tested per day). Study participants may therefore also represent a specific group of young adults who found managing diabetes at work to be psychologically stressful, but were actually quite successful at doing so. Participants' high levels of intelligence (as measured by their success at degree level) and access to resources (as evidenced by their access to private health insurance) may have assisted them here. Young adults lacking these internal and external resources may find managing diabetes at work to be even more difficult. Furthermore, due to the length of time that most of them had been living with diabetes many of the young adults in this study had likely developed a 'diabetes habitus' (Balfe, 2009), a set of guiding experiences that facilitated diabetes management in difficult contexts. Recently diagnosed young adults are likely to find diabetes management in the workplace to be harder. Although the study sample was predominantly female the issues that emerged from the study appear to us to be 'gender-neutral', in the sense that they would seem to be equally applicable to young men and women. However it may be that men experience the issues identified by this study but are more reluctant to talk about them. It is possible that more than women, men are 'silent sufferers' when it comes to the emotional difficulties stemming from balancing diabetes management with work. Men may also have different experiences regulating their diabetes in work that we were unable to capture given the study sample. A final limitation relates to the inductive nature of the findings, and the study's design. As noted, when constructing the study we did not anticipate that work would emerge so strongly in interviewees' accounts as a perceived barrier to diabetes management. The interviews were therefore not designed specifically to explore young adults' work-related experiences. As such there is important data, for example relating to how interviewees' workplace management of diabetes evolves over time,**

which we did not capture. Alternative study designs such as repeat interviews and/or ethnography, combined with a more specific focus on diabetes and work, may be useful to address the weaknesses of this study.

## 5. Conclusion

Young adults in their mid- to late-twenties can experience difficulties optimally managing Type 1 diabetes in the workplace, mainly as a result of time pressures and difficulties forming routines. The findings of this study indicate the importance of researchers paying attention to older young adults, as well as those making the transition to young adulthood, and to the role that environmental contexts play in young adults' diabetes management.

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	N (35)
Age (mean, SD)	26.9 (2.67)
Female	82.9%
No of years has diabetes (mean, SD)	11.5 (5.6)
A1C (mean, SD)	7.94 (0.76)
Number of blood tests per day (mean, SD)	4.47 (1.98)
On insulin pump (CSII)	25.7%
Educated to degree level	93.9%
Private health insurance	64.3%
Working in knowledge/professional sector	17
Working as administrator or secretary	6
Working part-time casual work (e.g. in	3

restaurant/coffee shop)	
Number of interviewees working more than one job	3
Had previously worked in knowledge/professional sector but now in University	4
Unemployed	5

Table 1. Demographic characteristics of young adults who took part in the study. This data is self-reported.

**Time pressures**

I'm actually finding it hard with my diabetes because I'm working now and doing stuff constantly and trying to make sure I don't have hypos or go too high or too low.

(Female, 23).

I keep an eye on it when I get a chance but sometimes the work is so on top of me that

I physically can't. (Female, 23).

Testing slips. Recording definitely slips. That's why I suppose I want to take a step back from the work. I realised when I got that news (HbA1c results) last week that I can't do it (Female, 26).

I had a row with a girl in work two months ago. We'd a very busy breakfast service and I was having an awful hypo and was standing in the corner scoffing pastries and she started giving out to me for not doing any work. I was trying to explain to her I'm a diabetic, I just need to eat this. Just leave me alone for five minutes and I'll come back. She just didn't get it. (Female, 26).

**Non-routine nature of work**

When I came back from Dublin I was trying to get my old position back with work and I was doing a bit of agency work for a while. Things were a bit flexible as in I never knew what was happening from one day to another and my diabetes certainly didn't know what was happening and I didn't know what was happening with that.

(Female, 28).

I'm not really on a schedule. I work nights as well and that changes depending on the day of the week. I often do some filming with a friend. I just am very busy sometimes. It's more difficult when another thing you have to worry about is to make sure you have food with you or if you had a hypo in the middle of something. (Male, 24)

It's just my diabetes hasn't been very well controlled. I was finding I suppose with shift work, my blood sugars one minute could be hypo and then the next I could be up in the 20's. I couldn't get it under control. I was taking my insulin as I was told. I also do volunteer work with children. I do that part time as well. Then you've home life as well and all sorts of bits and pieces. I don't have a 9-5pm Monday to Friday job with weekends off. Every week is different for me. (Age: 29, Female, 17)

#### **Local food environment**

I think I've always tended to snack. I think it's habit. Evenings it's usually around 6pm I start feeling hungry and there's always a ton of stuff at work. There is healthy stuff but unfortunately the other stuff is always far more tempting. Working with my company I have had easy access to food. We're never 100mtrs away from food. We stocked up kitchens with every goodie imaginable. It's good if you're there and you're hungry but it's also bad if you're there and take a break from your desk in the evening. The usual place to go is down to one of the kitchens (Female, 30).

Table 2 and 3. Additional interview quotes

**Disrupting food consumption**

I'm in work, snacking on whatever I can get my hands on. I could have up to 12 boluses a day. My consultant is not impressed! (Female, 23).

At the moment it's [food consumption] quite erratic because of the hours I'm keeping (Male, 28).

I suppose work would have somewhat thrown me off. It would have had an impact mid morning because I was having breakfast so early. I was finding I was having a few lows around 10 or 11am. I'd already be up five hours at that stage and not snacking regularly enough. It would have a knock on effect in the evenings as well if you were caught late in work, you might have a delay before you get around to eat some dinner. (Male, 30).

I think lack of routine had an effect, even though I know I'm working. Sometimes I could be late home and I'm eating my dinner at 8 or 9pm at night. I know it's not ideal for anyone but when you have diabetes that can impact more. (Female, 28).

Work has been quite stressful and, when I'm stressed I eat more. That has brought the sugars up a bit. Working longer hours and having my meals later in the evening so it could be 8 or 9pm by the time I get home and then if you're going to bed around 11pm there's not that much space between my last meal time insulin and the night time insulin I'm taking. (Female, 29).

**Seasonality-exercise**

I took up running a couple of months ago and with the weather getting worse and worse it's harder to get out. There's less motivation. It's much easier to sit and watch tv than go out in the rain. It's winter, it's work, the weather as well. The lack of motivation to go out and do that bit of exercise in the evening. Whereas in the summer I've been much better. (Female, 28)

Up until October I'd had almost perfect control for the last three years. And then, I don't really know what happened, but my HBA1C had gone up quite a lot in October. I was really annoyed and disappointed and couldn't figure out why. The more I thought about it the more, all through the summer I'd been doing a lot of exercise. The bright evenings help. With the evenings getting darker I was getting a bit lazier, I knew it wasn't going to be as good as it was. (Female 30),

### **Travel and diabetes management**

I'd never lived on my own before. While I was working in Australia I living with 12 people, I didn't have my family. In a way it made me very independent but it did make me quite cautious, particularly the first month. Then things settled down and that became the norm. I didn't have the safety net of having your family there who know what's going on with you. I wouldn't have been afraid at home if something had happened, you know you'll be looked after. Whereas if you're in a different country and things go wrong you know you'll have to deal with it. I think I needed to go away and be responsible and accountable for everything myself. (Female, 23).

**Highlights**

- This is one of the few studies to focus on young adults in their mid- to late-twenties. Most previous studies of young adults with diabetes have focused on university students.
- Young adults with diabetes in their twenties are likely to neglect or delay diabetes management activities in the workplace when they are under significant time pressures.
- The fragmented nature of modern ‘knowledge economy’ working environments can make it difficult for young adults with diabetes to develop diabetes management routines.
- In combination, workplace time pressures and lack of routine can make it difficult for young adults to find the time to exercise or to eat healthily.
- Young adults need to be provided with the tools and techniques that they can use to manage diabetes effectively in the workplace.